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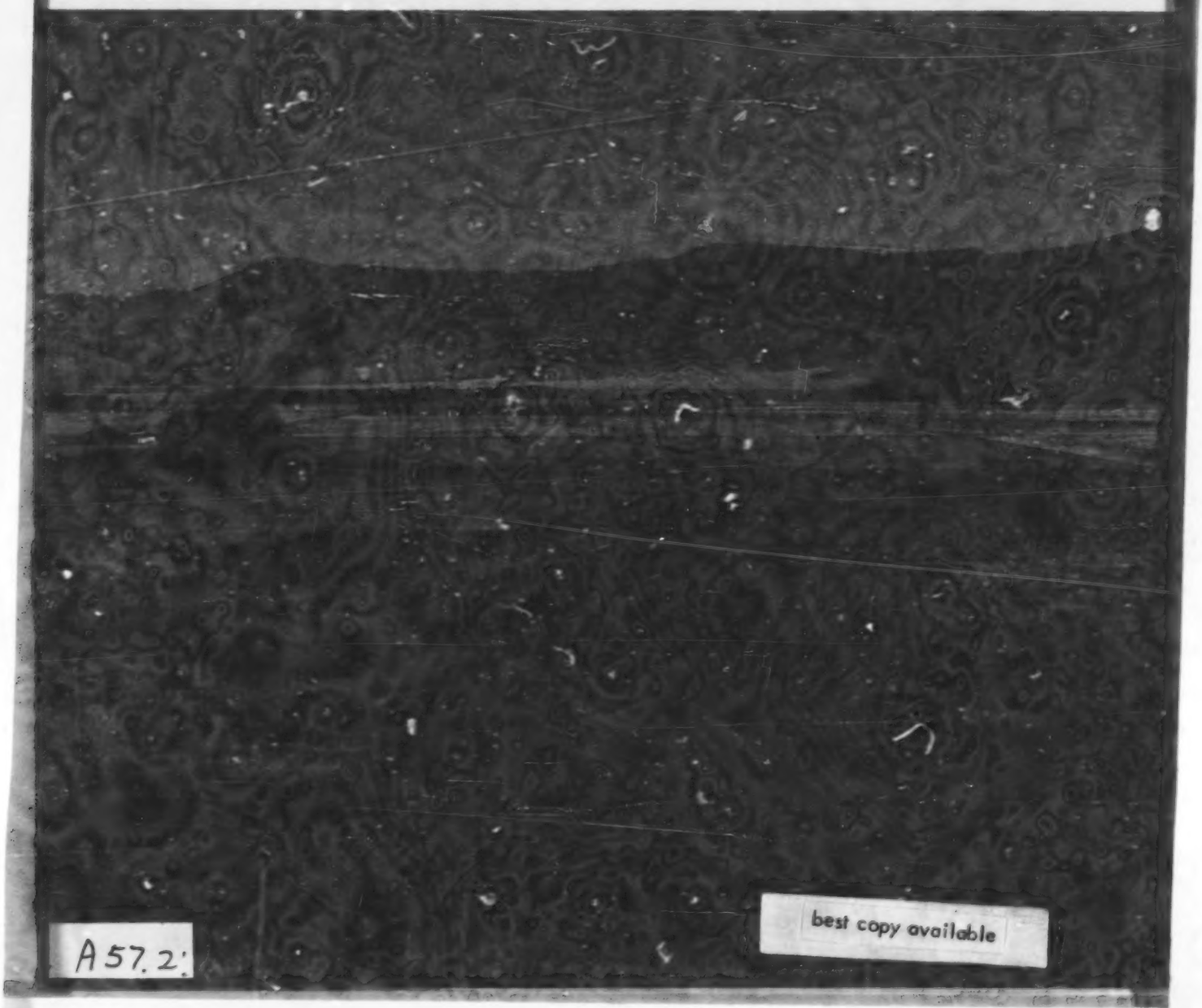
United States
Department of
Agriculture

**Soil
Conservation
Service**

Boise,
Idaho

Idaho's Soil and Water: Condition and Trends



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Introduction

One-third of Idaho's land is owned by private citizens, businesses, and State, county, city, and other units of non-Federal government. This booklet describes the conditions and trends of soil, water, and related resources on these non-Federal lands.

The data presented are part of the 1987 National Resources Inventory (NRI). It is the third in a series of inventories conducted at 5-year intervals by the U.S. Department of Agriculture's Soil Conservation Service (SCS).

These inventories serve a wide range of purposes, including monitoring trends in the status and condition of resources, helping formulate State and national legislation on resource concerns, and developing conservation policy and programs.

To assure statistical reliability at the State level, data were collected at scientifically selected random sites.

It is important to note that the 1987 NRI does not reflect implementation of any of the conservation provisions of the 1985 Food Security Act. These provisions provide for protection of highly erodible cropland in a 10-year conservation reserve, discourage the conversion of highly erodible land or wetlands to cropland, and encourage the use of conservation systems to reduce soil erosion on highly erodible cropland.

February 1991

Cover: Lower Wood River Valley and Silver Creek in Blaine County.

All programs and services of the U.S. Department of Agriculture, Soil Conservation Service, are offered on a nondiscriminatory basis without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Land use and cover in Idaho...

About one-third of Idaho's land is non-Federal rural land, some 19.1 million acres. It includes farms and ranches; urban, private, and Indian lands; and properties of State and local governments.

Rural land use is constantly changing. Between 1982 and 1987, the amount of rangeland decreased 1.8 percent, while all other land uses increased.

Surface Area of Land and Water

53,481,200 acres

	Acres	Percent
Federal land	33,189,600	62
Non-Federal rural land	19,151,600	36
Water bodies	663,300	1
Urban and built-up	476,700	<1

Uses of Non-Federal Rural Land

19,151,600 acres

	Acres	Percent
Rangeland	6,595,900	35
Cropland	6,531,700	34
Forest land	4,070,600	21
Pastureland	1,353,900	7
Other uses	599,500	3

Trends in Land Cover/Use

acres

Cover/Use	1987	Change since 1982
Cropland	6,531,700	+2.2%
Pastureland	1,353,900	+6.2%
Rangeland	6,595,900	-1.8%
Forest Land	4,070,600	+2.6%
Other	599,500	+6.8%
Total	19,151,600	

Classes of land... and how we use them

There are thousands of different soil types in Idaho. Detailed information on the management of each is available in soil surveys produced by SCS. The data are published on a county basis.

A simple guide to the land's ability to grow crops, though less precise than soil surveys, divides the rural landscape numerically into eight land capability classes. The higher a soil's class numeral, the greater are its limitations and the fewer its uses.

In general, Idaho farmers and ranchers use their land consistent with the land's capabilities.

Of the 87,200 acres of Class I land, with soils that are level, deep, well drained, and easy to work, 90 percent is being used as cropland. There is, however, relatively little Class I land. Most cropland is in Classes II and III. Soils in these classes are suitable for cropland but need protection with conservation measures when cultivated.

Most land in Classes V through VIII is used for pasture, range, forest, or other uses such as wildlife habitat. Though the land generally isn't suitable for cultivation, nearly 626,300 acres in these classes are planted to crops.

Use of Non-Federal Rural Land by Capability Class

acres

	I-III	IV	V-VIII
Cropland	4,620,800	1,284,600	626,300
Pastureland	488,000	406,000	459,900
Rangeland	316,700	1,135,100	5,144,100
Forest Land	142,300	769,800	3,158,500
Minor Land	89,800	40,100	442,400 *
Total	5,657,600	3,635,600	9,831,200

* Minor land includes all non-Federal rural land not included in the other four categories. To this total may be added 27,200 acres that are not assigned to a capability classification.

Cropland

Idaho has 6,531,700 acres of cropland. Fifty-four percent is irrigated; 46 percent is nonirrigated, receiving water only by natural precipitation.

Irrigated cropland

Irrigated cropland, located primarily in the deserts along the Snake River Plain, produces a wide range of crops under surface and sprinkler irrigation systems. The famous Idaho potatoes are produced there.

Nonirrigated cropland

Nonirrigated cropland in northern Idaho includes the Palouse and Nez Perce Prairies where annual precipitation averages 20 to 22 inches. Crops are primarily wheat and peas.

Nonirrigated cropland is also found in the southeastern Idaho Plateaus where annual precipitation averages 15 to 18 inches. Wheat and barley are the primary crops grown.

Conservation treatment needed

Conservation treatment is needed on 75 percent of all cropland. The other 25 percent is adequately protected, which means that soil erosion and other factors that limit sustained use are within acceptable limits.

About 68 percent of cropland needs protection against erosion. Improved water management on 17 percent of cropland could conserve water and prevent degradation of soil and water quality.

Trends in Cropland

acres

	1967	1977	1982	1987
Irrigated	2,941,426	3,617,000	3,561,500	3,498,500
Nonirrigated	3,041,240	2,664,000	2,828,600	3,033,200
Total Cropland	5,982,666	6,281,000	6,390,100	6,531,700

Soil Erosion

Soil erosion is the wearing away of the soil by water, wind, and other forces. Erosion robs the soil of its productivity and is the largest source of pollutants in Idaho's waterways.

About 34 percent of Idaho's cropland is eroding at two or more times the soil loss tolerance.

In 1987, sheet and rill erosion moved 27.4 million tons of soil on cropland; wind erosion moved over 25.4 million tons.

Average annual sheet and rill erosion on cropland decreased about 20 percent from 1982 to 1987.

Some of this reduction is probably due to conservation practices such as conservation tillage installed during the 5-year period. Farmers were using conservation tillage practices on 1,633,400 acres, or 25 percent of total cropland, in 1987.

The severity of erosion by water is not fully illustrated by sheet and rill erosion rates. Irrigation-induced erosion, caused by irrigation water running over the soil surface, is a major problem on cropland in southern Idaho. Collection of data on this problem, however, is not included in the NRI.

Wind erosion rates on cropland increased about 13 percent during the 5-year period. Part of this increase is due to a growing awareness of wind erosion problems which resulted in inventory design changes for 1987. Statewide, wind erosion on cropland totaled over 25.4 million tons in 1987.

Cropland Erosion

tons/acre/year

	1982	1987
Sheet and Rill	5.3	4.2
Wind	3.4	3.9

Cropland Erosion Greater than T

acres

Rate	Wind	Water	Total
>2T <5T	810,400	878,600	1,689,000
>5T	344,700	162,900	507,600

Over the years, SCS has established soil loss tolerance (T) values which serve as a goal in conservation planning. T values for cropland range from 1 to 5 tons per acre annually. T values consider in a general way the long-term effects of erosion on fertility, tilth, structure, and water-holding capacity.

Serious Erosion Areas

Palouse

The Palouse is located in the northern Idaho Panhandle. Croplands are steep and hilly with slopes ranging to 45 percent. Runoff from winter snowmelt on frozen soils causes average erosion rates of about 11 tons per acre each year.

Sheet and rill erosion is down an average of 2.5 tons per acre from the 1982 NRI. This reduction is due primarily to farmers' adoption of conservation tillage and crop residue management systems.

Counties with the highest sheet and rill erosion rates are Benewah, Clearwater, Idaho, Kootenai, Latah, Lewis, and Nez Perce.

Snake River Plain

The Snake River Plain, stretching across southern Idaho, contains most of Idaho's irrigated cropland. The Plain consists of relatively flat cropland irrigated by sprinkler and surface irrigation systems.

The dominant erosion problem on irrigated cropland is erosion induced by irrigation. The problem exists primarily on surface irrigated cropland.

Though not monitored by NRI, research has shown furrow irrigated crops on slopes greater than 2 percent will erode 50 to 65 tons of soil per acre per year.

Irrigation-induced erosion under sprinklers occurs when the a system malfunctions, the sprinkler design is improper, or tillage has compacted the soils and reduced the moisture intake rate to less than the sprinkler application rate.

Counties with large amounts of irrigation-induced soil erosion are Canyon, Cassia, Jerome, Minidoka, Payette, Twin Falls, and Washington.

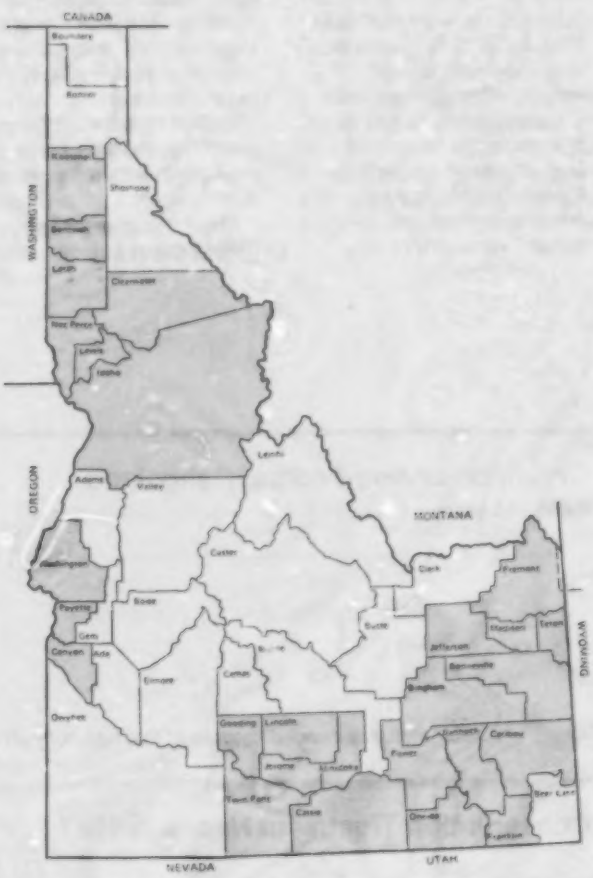
Wind erosion is also a significant problem on the Snake River Plains. Each year, from 5 to 10 tons of soil erode on the sandier soils. Counties with the most severe wind erosion are Bannock, Bingham, Bonneville, Cassia, Fremont, Gooding, Jefferson, Jerome, Lincoln, and Minidoka.

Southeastern Idaho

Southeastern Idaho dry cropland produces primarily wheat and barley grown in combination with the practice of summer fallow to conserve moisture. Fallowing leaves the soil bare, loose, and unprotected. Serious water-caused sheet and rill erosion occurs each spring as winter snow melts and again in the summer during thunderstorm periods.

Topsoil in southern Idaho is typically about 15 inches deep over white infertile subsoil. During the 80 to 100 years these soils have been farmed, about half of the topsoil has been eroded. In many areas, tillage turns up the infertile subsoil. When this happens, crop production generally becomes uneconomical.

Average soil erosion rates in 1987 were 8.1 tons per acre per year, down 1.7 tons from 1982 estimates. The primary reason for the decrease is farmers' adoption of conservation tillage and crop residue use practices.



Counties with significant water erosion problems on dry cropland are Bannock, Bonneville, Caribou, Franklin, Fremont, Madison, Oneida, Power, and Teton.

Rangeland

Range vegetation is an important renewable resource and an integral part of the resource base.

The climax plant cover on Idaho's 6,595,900 acres of non-Federal rangeland is mostly native grasses, forbs, and shrubs usable and valuable as forage for animal production and for wildlife habitat. It is also a source of water for agricultural, industrial, recreational, and domestic use.

The health of rangeland is measured by range conditions. More than 3.8 million acres (58%) of non-Federal rangeland are in less-than-good condition. About 19 percent of rangeland was identified as adequately protected and thus needs only continued proper management.

About 55 percent of rangeland needs improvement that can be achieved by practices such as proper grazing use, deferred grazing, planned grazing systems, and fencing and water facilities for improved animal control and grazing distribution.

More intensive treatment such as weed control or brush management is needed on 41 percent of rangeland. This action would increase forage for livestock, improve habitat for wildlife, and increase the quality and quantity of the water supply (more than 1 million acre feet) that originates in rangeland watersheds.

Average annual sheet and rill erosion on rangeland in 1987 was 0.5 ton per acre per year, the same as 1982. Only 4 percent of rangeland needs conservation treatment for erosion control.

Condition of Non-Federal Rangeland

6,595,900 acres

	Acres	Percent
Excellent	274,500	4
Good	2,080,800	32
Fair	2,575,100	39
Poor	1,263,600	19
Other*	401,900	6

**Other" includes seeded rangeland that has not yet developed characteristics of the native plant community.*

Conservation Treatment Needs in 1987

	Acres	Percent
Treatment not needed	1,263,200	19
Treatment needed	5,332,700	81

Forest Lands

Forest land has many uses. It produces wood products, recreation, and wildlife habitat. It is also a primary source of water.

Idaho's 4,070,600 acres of non-Federal forest land occur in the foothills and mountains of southern and eastern Idaho and from the valley floor into the mountains of central and northern Idaho. About 70 percent of this land is owned by small woodlot owners and farmers. The remaining 30 percent is owned by private industry.

The demand for non-Federal forest land harvests continues to increase, while net annual growth per acre remains relatively stable.

About one-third of the forest land is adequately protected through conservation treatment. Implementation of improved conservation treatment by Idaho forest landowners would help this land achieve its potential.

About 29 percent of grazed forest lands needs timber stand improvement to bring about desired conditions and production; 18 percent needs timber establishment and 15 percent needs management for forage improvement.

About 36 percent of ungrazed forest land needs timber improvement; 21 percent needs timber establishment.

Average annual sheet and rill erosion on forest lands increased 0.2 ton per acre per year, from 1.5 tons per acre per year in 1982 to 1.7 tons per acre per year in 1987. About 19 percent of grazed and 24 percent of ungrazed forest land needs conservation treatment for erosion control.

Non-Federal Forest Lands

4,070,600 acres

	Acres	Percent
Grazed	2,008,700	49
Ungrazed	2,061,900	51

Conservation Treatment Needs in 1987

acres

	Acres	Percent
Grazed		
Treatment not needed	739,600	37
Treatment needed	1,269,100	63
Ungrazed		
Treatment not needed	635,300	31
Treatment needed	1,426,600	69

Wetlands

Idaho has 506,700 acres of non-Federal wetlands that are used for wildlife habitat, flood control, trapping nutrients and pollutants, recharging aquifers, livestock production, and recreation.

Most wetlands are in northern and eastern Idaho and include natural and artificial wetlands. Artificial wetlands are typically associated with irrigated lands on cropland and pasture land.

The Swampbuster provision of the 1985 Food Security Act is designed to discourage conversion of wetlands for agricultural commodities.

Wetland types listed in order of significance according to acres (most to least) are:

- Type 1 - seasonally flooded basins or flats
- Type 2 - inland fresh meadows
- Type 5 - inland open fresh water
- Type 3 - inland shallow fresh marsh
- Type 6 - shrub swamps
- Type 8 - inland fresh bogs.

Idaho's wetlands provide diverse and productive habitat for fish and wildlife. They are also important in maintaining groundwater supplies and water quality.

SCS Programs...adapting to changing needs

The text, maps, charts, and graphs that you've just read tell a sobering story about our basic resources. However, the technology of soil and water conservation can reduce erosion on most soils to acceptable limits, increase rangeland and forest land productivity, and improve water quality and quantity.

SCS's ongoing programs in Idaho address these conservation priorities. As you read about them in the following pages, remember that the soil and water conservation programs we promote must be implemented by the people who own and operate the land.

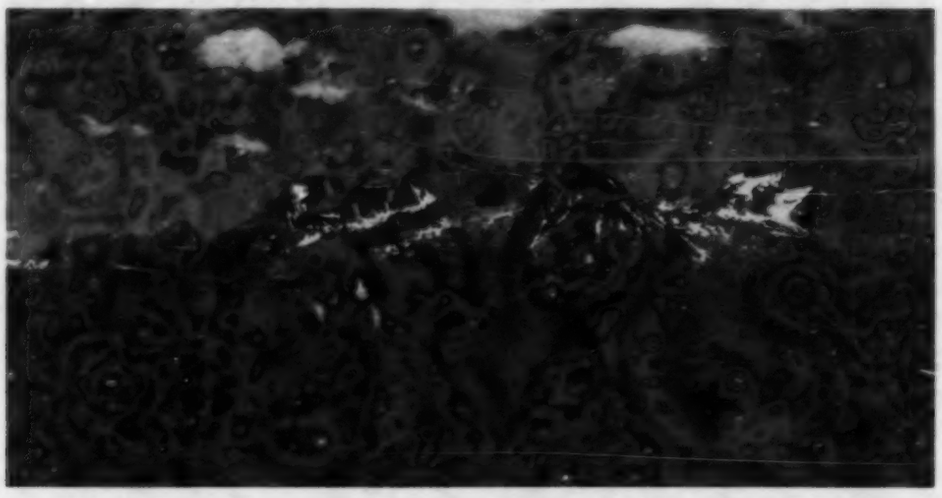
Mission of the Soil Conservation Service

The mission of the Soil Conservation Service covers three major areas: soil and water conservation, natural resource surveys, and community resource protection and management.

SCS focuses its assistance on non-Federal land, providing technical assistance to farmers and ranchers. SCS helps them plan and apply conservation practices and systems to reduce soil erosion and protect and conserve water. The guiding principle is the use and conservation treatment of the land in harmony with its capabilities and needs.

SCS has a statewide network of conservation specialists with offices in almost every county. Land users get help from SCS mainly through Idaho's 51 locally organized and locally run soil conservation districts that cover the entire State.

More than two-thirds of Idaho's non-Federal rural land is used to produce crops and livestock.



Soil and Water Conservation

1985 Food Security Act

To implement the highly erodible land, wetland, and Conservation Reserve Program (CRP) provisions of the 1985 Food Security Act, SCS provides technical assistance to farmers and ranchers . SCS field staffs make highly erodible land and wetland determinations and help farmers and ranchers develop conservation plans and apply practices needed to ensure compliance with the law.

To retain their eligibility for USDA farm program benefits, farmers had until Dec. 31, 1989, to have an approved conservation plan developed on all highly erodible cropland. They will apply and maintain conservation and management practices on about 3.5 million acres before Dec. 31, 1994. SCS estimates that implementation of these conservation plans will help reduce soil erosion by 50 percent.

Idaho farmers have enrolled 791,061 acres of erodible cropland in the CRP. This land will remain in vegetation for at least 10 years. Estimated erosion reduction is more than 12.5 million tons.

Cropland

SCS conservationists provide information and onsite assistance to farmers on many practices that protect soil and water resources on cropland.

SCS agronomists and soil conservationists prepare technical standards and specifications for agronomic practices that fit the local soil, climate, and other physical conditions.

Rangeland

About 52 percent of Idaho's non-Federal land is privately owned rangeland, grazed woodland, and pasture land that is used mainly to produce forage for livestock. It also provides habitat for many kinds of wildlife, and its vegetation protects watersheds against erosion.

SCS range and soil conservationists help ranchers identify, inventory, and evaluate their soil, water, plant and animal resources; choose the kinds of management and treatment that ensure best use of the resources; and apply the planned conservation measures.

Forest Land

SCS conservationists help owners and operators plan the use of forest land resources.

SCS also provides assistance in planning and managing windbreaks to get the optimum benefits of controlling wind erosion, protecting farmsteads and feedlots, and providing wildlife habitat.

Plant Materials

The Plant Materials Center (PMC) at Aberdeen, Idaho, is part of a national plant materials program operated by SCS. The purpose of the PMC is to assemble, evaluate, and release new plant materials for conservation use. Twelve conservation plants released by the Aberdeen PMC and cooperating agencies are in widespread use today, the result of continuing efforts by SCS to find plants that can help solve soil and water resource problems.

Water Quality and Quantity

SCS helps plan and design many practices that conserve water and improve water quality. Soil conservationists help farmers determine how much water to apply and when and how to apply it. They also plan improved irrigation systems and management. Soil and snow surveys provide important information on which to base this assistance.

SCS works to meet national goals for water quality by helping farmers install conservation practices that control soil erosion, reduce water runoff, and manage animal wastes. The practices improve water quality by reducing pollutants such as sediment, pesticides, nutrients, and organic waste that can reach waterways.

SCS provides technical assistance to soil conservation districts that receive water quality planning and implementation grants through the State Agricultural Water Quality Program. Assistance includes project and practice planning amd installation and maintenance of best management practices.

Natural Resource Surveys

Soil Surveys

SCS conducts soil surveys to determine the kinds of soils, potential alternative uses, and what is required for full use and conservation. Published soil surveys for a county or designated area include maps with explanatory information useful in many Federal, State, county, and local community programs. Special reports are prepared and released as needed for local uses.

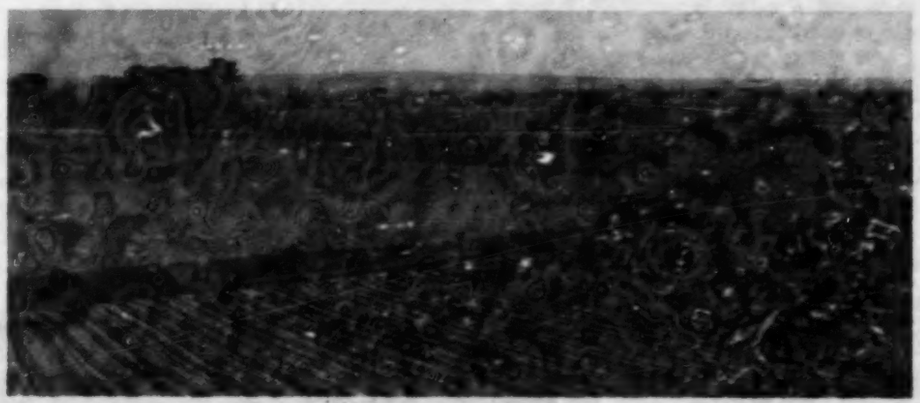
All cropland soils in the State have been mapped. There are 26 published soil surveys.

Snow Surveys and Water Supply Forecasting

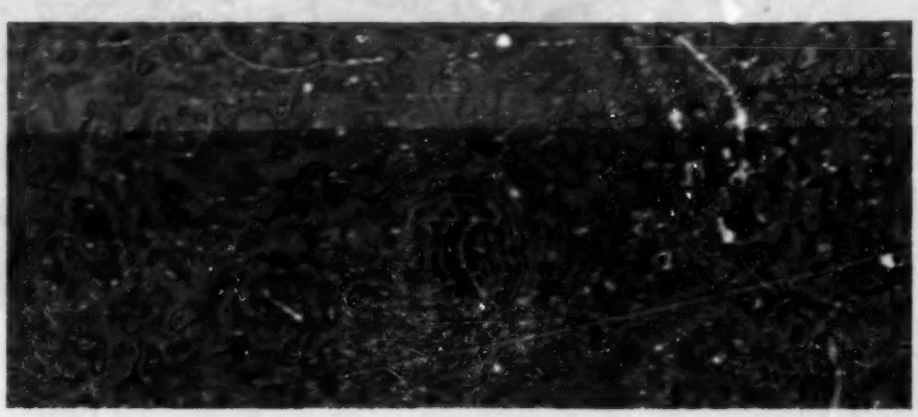
Idaho's irrigated land is served by snow surveys and water supply forecasts. Reports are issued monthly from January to June by the SCS state office in Boise.

They are used by farmers, ranchers, and water management groups for flood control, recreation, fish and wildlife, power generation, municipal and industrial water supply, and water quality management.

The Snake River Plain stretching across southern Idaho contains most of our irrigated cropland. The soils are fertile and productive but highly erodible. Grassed filter strips help prevent water pollution.



Conservation tillage is a very successful technique for controlling erosion on both dry and irrigated cropland. Here, potatoes are planted in wheat straw residue.



Community Resource Protection and Development

Watershed Projects

SCS helps sponsoring local organizations plan small watershed projects to protect, improve, and develop the water and land resources of watersheds which measure up to 250,000 acres.

The majority of Idaho's projects emphasize watershed protection and primarily consist of planning and applying soil and water conservation practices to the land. These projects address soil erosion, water conservation, water quality, and the impact of upstream flooding.

River Basin Studies and Investigations

Public Law 566 provides for cooperation among USDA agencies and other Federal and State agencies in river basin planning, surveys, and investigations. SCS directs these activities, working closely with soil conservation districts and other agencies.

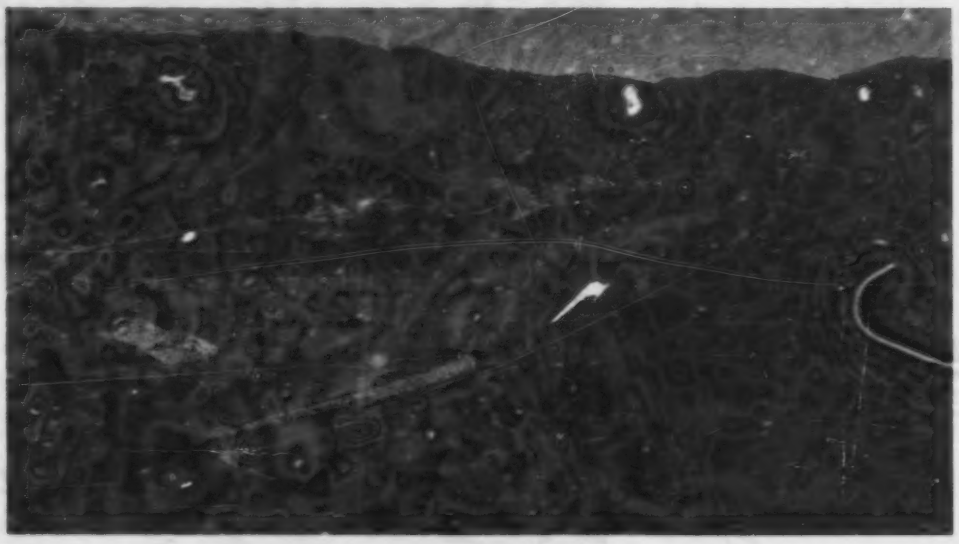
River basin studies have been completed on the Upper, Middle, and Lower Snake River and the Bear River.

Resource Conservation and Development Areas (RC&D)

RC&D areas cover over half of the State's 44 counties. These locally sponsored areas plan for resource development, economic improvement, and conservation projects.

SCS is responsible for administering this program and provides technical and financial assistance to carry out program activities. RC&D sponsors seek the help of local, State, and other Federal agencies that can help with area-wide planning and implementat programs.

Montpelier Dam and Reservoir in Bear Lake County provides flood protection, irrigation water, and recreation for local people. This small watershed project was developed by local sponsors with financial and technical help from SCS.



Join Our Team

Conserving soil and water for future generations requires everyone's help. The volunteer arm of SCS, known as the Earth Team, recruits volunteers to work in our offices. The Earth Team has opportunities for everyone whatever their skills or interests.

Earth Team volunteers work directly with private landowners, soil conservation districts, and local SCS offices. Jobs vary greatly and include such tasks as laying out conservation practices, office support services, taking photos, writing for media, speaking to community groups, and environmental education.

By becoming an Earth Team volunteer, you can make a difference in your community. Anyone 16 years of age or older can join.

For more information about the Earth Team, call your local SCS office. The telephone number is listed under United States Federal Government, Department of Agriculture, Soil Conservation Service